

# Scenario 62.01: Buildup of Laser Oscillation

In this scenario we simulate and visualize the buildup of laser oscillation based on the Fox-Li numerical approach.

Keywords: laser resonator, Fox-Li, laser oscillation

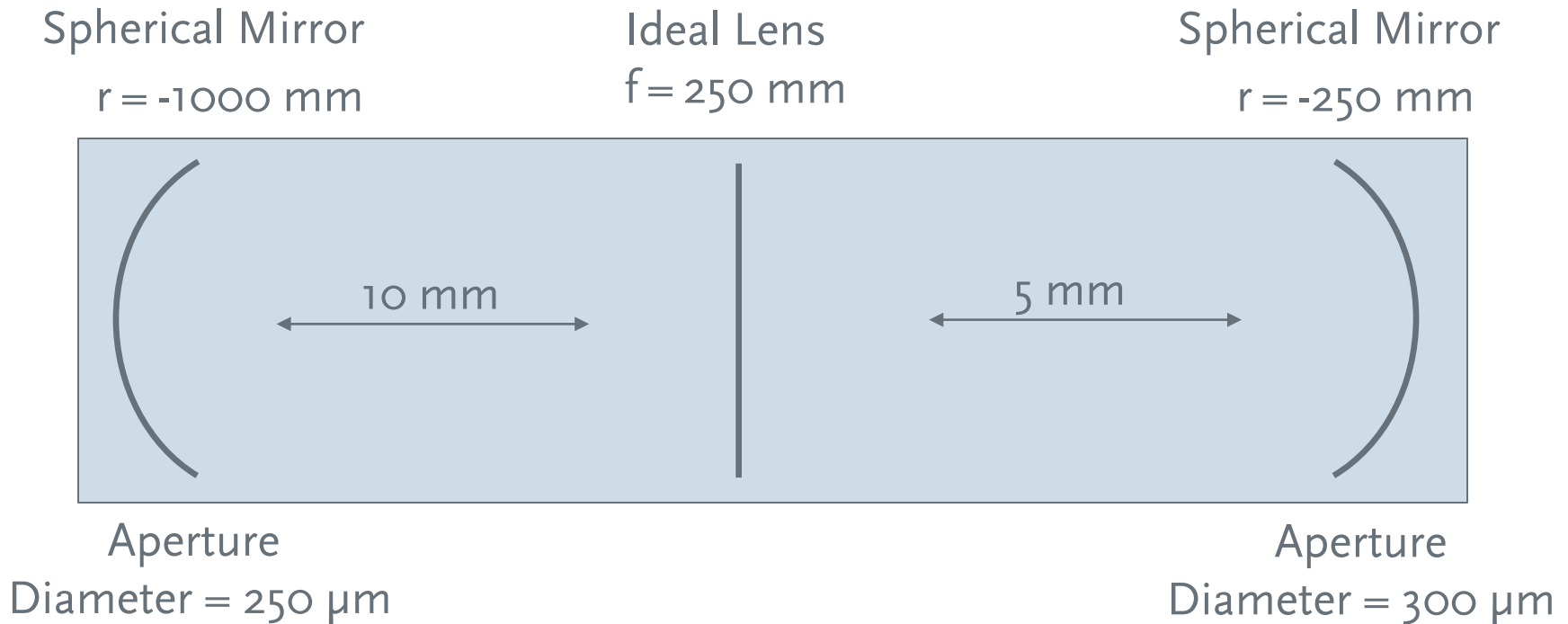
Required Toolboxes: Laser Resonator Toolbox

Related Application Scenarios: Scenario 08.01, Scenario 09.01, Scenario 12.01

Related Tutorials: FS.009

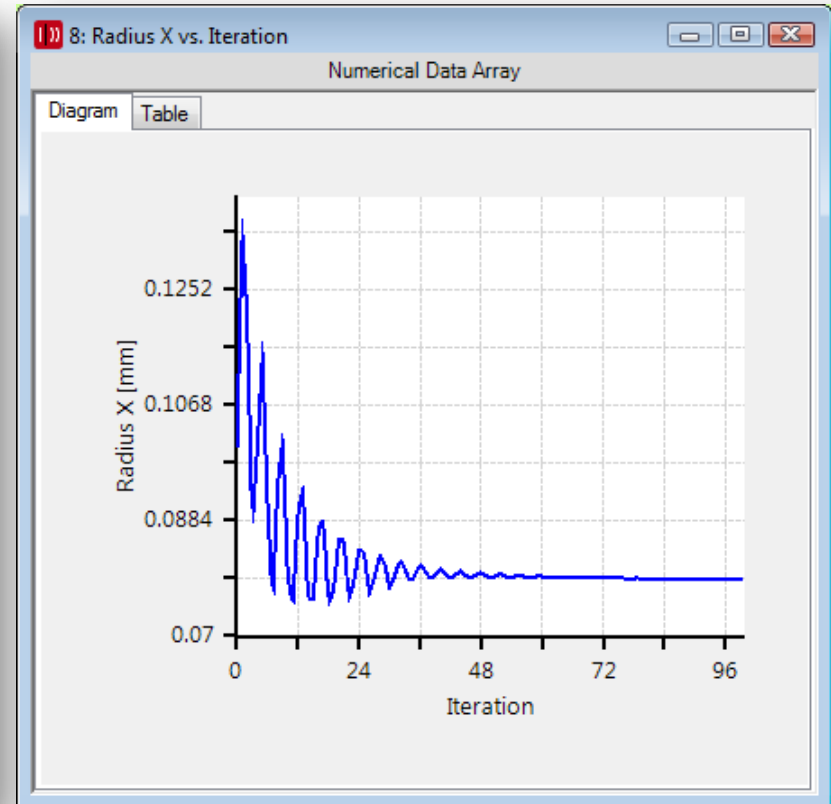
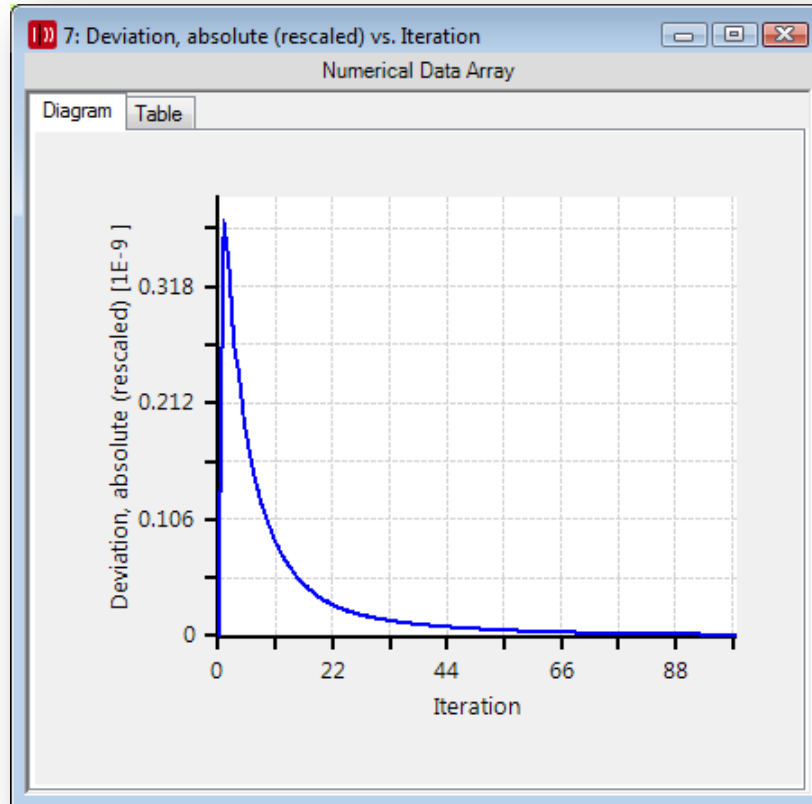


# Modeling Task



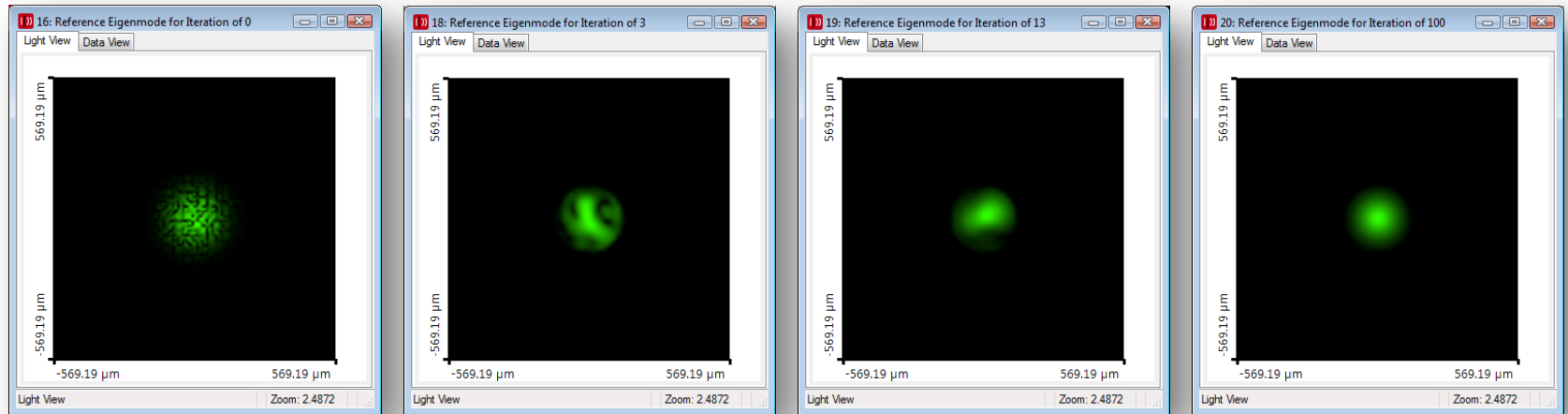
- The ideal lens replaces a real (thermal) lens since the simulation is much faster for ideal components.
- We investigate the buildup of laser oscillation without gain for the resonator system and visualize the results as an animation.

# Results



Deviation of successive iterates (left) and beam radius (right) over number of iterations for the Fox-Li iteration.

# Buildup of Laser Oscillation



- Mode in reference plane after 0, 3, 13 and 101 iterations, respectively (from left to right). Iteration 0 corresponds to the initial mode.
- VirtualLab<sup>TM</sup> can also generate an animation file of all modes allowing to play the buildup of laser oscillation as an animation.

# Conclusion

- As it was shown, VirtualLab™ allows to simulate the buildup of a laser oscillation.
- The iteration document is used to this end which allows to evaluate how various parameters (including the laser mode itself) change during the buildup.